

## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 13 SEP 2005

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Applicant's or agent's file reference 24056PCAU	<b>FOR FURTHER ACTION</b> See Form PCT/IPEA/416	
International application No. CT/AU2004/001365	International filing date (day/month/year) 7 October 2004	Priority date (day/month/year) 9 October 2003
International Patent Classification (IPC) or national classification and IPC Int. Cl. <sup>7</sup> B41M 3/14, G07D 7/12		
Applicant SECURENCY PTY LIMITED et al		

- This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 3 sheets, including this cover sheet.
- This report is also accompanied by ANNEXES, comprising:
- a. ☒ (sent to the applicant and to the International Bureau) a total of 4 sheets, as follows:
- ☒ sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions),
- ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
- b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or table related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

## 4. This report contains indications relating to the following items:

- ☒ Box No. I Basis of the report
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

Date of submission of the demand 7 February 2005	Date of completion of the report 30 August 2005
Name and mailing address of the IPEA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized Officer  <b>XAVIER GISZ</b> Telephone No. (02) 6283 2064

# INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.  
PCT/AU2004/001365

## Box No. I Basis of the report

With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This report is based on translations from the original language into the following language which is the language of a translation furnished for the purposes of:

- ☐ international search (under Rules 12.3 and 23.1 (b))
- ☐ publication of the international application (under Rule 12.4)
- ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

☐ the international application as originally filed/furnished

☒ the description:

pages 1-10 as originally filed/furnished  
pages\* received by this Authority on with the letter of  
pages\* received by this Authority on with the letter of

☒ the claims:

pages 11, 12 as originally filed/furnished  
pages\* 16-19 as amended (together with any statement) under Article 19  
pages\* received by this Authority on with the letter of  
pages\* received by this Authority on with the letter of

☒ the drawings:

pages 1/1 as originally filed/furnished  
pages\* received by this Authority on with the letter of  
pages\* received by this Authority on with the letter of

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. ☒ The amendments have resulted in the cancellation of:

- ☐ the description, pages
- ☒ the claims, pages 13-15
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to the sequence listing (*specify*):

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to the sequence listing (*specify*):

\* If item 4 applies, some or all of those sheets may be marked "superseded."

# INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.  
PCT/AU2004/001365

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Statement

Novelty (N)	Claims 1-39	YES
	Claims	NO
Inventive step (IS)	Claims 1-39	YES
	Claims	NO
Industrial applicability (IA)	Claims 1-39	YES
	Claims	NO

Citations and explanations (Rule 70.7)

Claims 1-39 meet the criteria set forth in PCT Articles 33(2) and 33(3) for novelty and inventive step. The prior art published before the priority date does not disclose or obviously suggest a security document comprising a layer of upconverting fluorescent material and a coating of refractive pigment as presently defined.

## AMENDED CLAIMS

[received by the International Bureau on 07 February 2005 (07.02.05);  
claims 24, 30-35 amended, claims 36-39 added, remaining claims unchanged (4 pages)]

transparent substrate and the coating containing the refractive pigment is an opacifying coating which is applied only partly over the transparent substrate to form a window on at least one side of the security document which is not covered by the opacifying coating.

5 19. A security document as claimed in claim 18 wherein the opacifying coating is applied only partly on one side of the substrate, and the opacifying coating is applied to cover the entire surface of the polymeric layer on the opposite side of the substrate.

10 20. A security document as claimed in claim 18 or claim 19 wherein the signal emitted from parts of the substrate covered by the opacifying coating is stronger than the signal emitted from parts of the substrate which are uncovered by the opacifying coating.

15 21. A security document as claimed in any one of the preceding claims wherein the upconverting material is uniformly dispersed in the polymeric material.

22. A security document as claimed in any one of the preceding claims wherein the concentration of upconverting material is not more than about 1% by weight of the polymeric material.

20 23. A security document as claimed in claim 22 wherein the concentration of upconverting material is substantially within the range from about 0.0025% to about 0.25% by weight of the polymeric material.

25 24. A method of manufacturing a security document including: providing a substrate having at least one layer of polymeric material; incorporating at least one upconverting fluorescent material in the at least one layer of polymeric material; and applying a refractive coating to at least one surface of the substrate, wherein the refractive coating contains at least one refractive pigment which enhances signals emitted from the fluorescent upconverting material when the

security document is exposed to electromagnetic radiation of a particular wavelength.

25. A method as claimed in claim 24 wherein the upconverting material is incorporated into the at least one layer of polymeric material in an extrusion process.
26. A method as claimed in claim 25 wherein in the extrusion process, the upconverting material is mixed uniformly with the co-extruded polymeric material as it passes through the extruder and dies.
27. A method as claimed in claim 26 wherein the upconverting material is mixed with the polymeric material, in an extruder barrel, at an elevated temperature.
28. A method as claimed in any one of claims 24 to 27 wherein the concentration of the upconverting material is not more than about 1% by weight of the polymeric material.
29. A method as claimed in claim 28 wherein the concentration of upconverting material falls substantially within the range from about 0.0025% to about 0.25% by weight of the polymeric material.
30. A method as claimed in any one of claims 24 to 29 wherein the at least one refractive pigment is dispersed in a polymeric or resin binder.
31. A method as claimed in any one of claims 24 to 30 wherein the at least one refractive pigment is selected from the group including titanium dioxide, calcium carbonate, barium sulphate and zinc oxide.
32. A method of verifying the authenticity of a security document including:  
providing a substrate including at least one polymeric layer containing an upconverting fluorescent material;

providing the substrate with at least one opacifying coating containing a refractive pigment;

exposing the upconverting material to electromagnetic radiation of a selected wavelength to excite the upconverting material; and

5 detecting a signal of electromagnetic radiation emitted from the excited upconverting material at a shorter wavelength than the wavelength selected to excite the upconverting material.

33. A method as claimed in claim 32 wherein the electromagnetic radiation selected to excite the upconverting material is infra red radiation, and the signal of  
10 electromagnetic radiation emitted from the upconverting material falls within the visible spectrum.

34. A method as claimed in claim 32 or claim 33 wherein the at least one opacifying coating only partly covers the substrate, and different signals emitted from the covered and uncovered parts of the substrate are analysed to  
15 authenticate the security document.

35. A method of manufacturing a security document including : providing a substrate having at least one layer of polymeric material; incorporating at least one upconverting fluorescent material in the at least one layer of polymeric material by an extrusion process; and applying a refractive coating to at least one  
20 surface of the substrate.

36. A method as claimed in claim 35 wherein in the extrusion process, the upconverting material is mixed uniformly with the co-extruded polymeric material as it passes through the extruder and dies.

37. A method as claimed in claim 36 wherein the upconverting material is  
25 mixed with a polymeric material, in an extruder barrel, at an elevated temperature.

38. A method as claimed in any one of claims 35 to 37 wherein the concentration of the upconverting material is not more than about 1% by weight of the polymeric material.

39. A method as claimed in claim 38 wherein the concentration of  
5 upconverting material falls substantially within the range from about 0.0025% to about 0.25% by weight of the polymeric material.